

REMARKS

New claims 21-31 are presented. Support is provided from the specification, for example, paragraphs 1, 17, and 18, Examples 1-5, and original claims 1-3 and 5-11. See *In re Gardner*, 177 USPQ 396, 397 (CCPA 1973) and MPEP §§ 608.01 (o) and (l). No new matter is added.

Obviousness Rejection

The Examiner has maintained the rejection of claims 1-20 as obvious under 35 USC § 103 in view of Tedeschi et al. US Patent No. 3,709,946 ("Tedeschi"). (Paper No. 20080116 at 2.) This is the sole remaining rejection of the claims.

In making the rejection, the Examiner contended that "one of ordinary skill in the art would find it obvious to use any ketone or a ketone that is in close relationship to that which is claimed." (Id.) The Examiner asserted that because "[Tedeschi] has used acetone in their invention," that it "would be obvious for one of ordinary skill in the art ... to utilize the disclosure of [Tedeschi] and incorporate any ketone as taught." (Id.) The Examiner further contended that "one of ordinary skill in the art at the time of the instant invention would not only find it obvious to do so, but would be motivated to use methyl ethyl ketone and any other homolog to that which is taught in order to prepare the corresponding acetylenic alcohol." (Id.)

Regarding the Declaration of Dr. Werner Bonrath under 37 CFR § 1.132 ("the Bonrath Declaration") that Applicants submitted with the Submission Pursuant to 37 CFR 1.114: Response to Final Action dated October 3, 2007, the Examiner asserted

that “[a]fter careful consideration of the disclosure of [Tedeschi] and the showing of unexpected results, the Examiner has concluded that [Tedeschi’s] ratio of alkali metal hydroxide to ketone is within the claimed range. This information shows that it would be obvious for one of ordinary skill in the art at the time of the instant invention to optimize their process results by utilizing any such ratio within the range disclosed.” (Id.) The Examiner referred to “column 2, lines 60-64 [of Tedeschi] to [indicate] that the ratio quoted previously by the Examiner was incorrect. The ratio [referred to in Tedeschi] is a range of 0.5-0.001; wherein that which is claimed equals to about 0.005.” (Id. at 3-4.) The Examiner concluded that “[o]ne having ordinary skill in the art would find it obvious to utilize any such ratio within that which has been disclosed including one which is equal to 0.005.” (Id. at 4.)

The Examiner further asserted that “applicant’s showing of unexpected results merely shows an optimization of process parameters. The high ratio is in direct proportion to a high conversion to product; whereas as a low ratio shows a low conversion to product.” (Id.) The Examiner stated that the results “also [show] that [the] high ratio yields a higher by-product percentage than that of a low ratio...” (Id.) The Examiner concluded that “this information merely shows optimization of the process parameters and this information is not held as patentably distinct information.” (Id.)

The arguments presented in prior responses, including the Bonrath Declaration are hereby incorporated by reference and reasserted herein. It is respectfully submitted that for the reasons already of record and those presented below, the claims pending and under examination are not rendered unpatentable in

view of Tedeschi. Claim 1 recites "[a] process for the manufacture of an acetylenically unsaturated alcohol comprising reacting a carbonyl compound with acetylene in the presence of ammonia and an alkali metal hydroxide, wherein the carbonyl compound is selected from a group consisting of methyl ethyl ketone, methylglyoxal dimethylacetal, 6-methyl-5-hepten-2-one, 6-methyl-5-octen-2-one, hexahydropseudoionone, 4-(2,6,6-trimethyl-1-cyclohexen-1-yl)-3-buten-2-one and 6,10,14-trimethyl-2-pentadecanone, the alkali metal hydroxide is used in aqueous solution and the molar ratio of the alkali metal hydroxide to the carbonyl compound is less than 1 : 200." Claim 21 recites "[a] process for the manufacture of an acetylenically unsaturated alcohol comprising reacting a carbonyl compound with acetylene in the presence of ammonia and an alkali metal hydroxide, wherein the alkali metal hydroxide is used in aqueous solution and the molar ratio of the alkali metal hydroxide to the carbonyl compound is less than 1 : 200."

Respectfully, we submit that the Examiner has improperly dismissed the evidence presented in the Bonrath Declaration, having summarily concluded that "[o]ne having ordinary skill in the art would find it obvious to utilize any ... ratio within that which has been disclosed including one which is equal to 0.005." (Id. at 4.) Tedeschi discloses a large range of alkali metal hydroxide : ketone molar ratio of 0.001 to 0.5 mole per mole of ketone which correlates to a molar ratio of the alkali metal hydroxide to the carbonyl compound of from 1 : 1000 to 1 : 2. The Examiner has overlooked the fact that Tedeschi specifically discloses the use of molar ratios of alkali metal hydroxide to ketone of 1:12, 1:6, and 1:6 in Examples 1, 2 and 3, respectively, which are outside the presently claimed range. It is well settled law that a "generic" disclosure does not render everything within its scope obvious." *Ex parte Rozzi*, 63 USPQ2d at 1201 ("The

Examiner does not make out a case of obviousness merely by virtue of the fact that the subject matter of a rejected claim is, to use the Examiner's words, 'generically' described by the prior art.") Furthermore, the scope of the range disclosed by Tedeschi is not supported by the ratios exemplified by Tedeschi. At bottom, the Examiner has identified no disclosure or suggestion in Tedeschi or anywhere else to use a molar ratio of alkali metal hydroxide : carbonyl compound of "less than 1 : 200" as claimed. For this reason alone, the rejection should be withdrawn.

In addition, the Examiner has seemingly ignored that objective evidence of obviousness in the form of unexpected results must be considered. The Patent Office Guidelines entitled *Examination Guidelines for Determining Obviousness Under 35 USC 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc.*, Fed. Reg. Vol. 72, No. 195, pages 57526 - 57535, October 10, 2007 ("*Guidelines*"), require consideration of the basic factual inquiries of the Supreme Court decision in *Graham v John Deere Co.*, 148 USPQ 459 (Sup. Ct. 1966) ("*Graham*"), including objective evidence of non-obviousness, for example, in the form of evidence of unexpected results. Page 57527, Column 1. The Guidelines quote the Supreme Court opinion in *KSR International Co. v. Teleflex Inc.*, signifying that "the [*Graham*] factors continue to define the inquiry that controls." *Guidelines* at 57527, Column 2, citing 82 USPQ2d at 1385, 1391 (Sup. Ct. 2007) ("*KSR*").

In addition, it is submitted that the Examiner has mischaracterized the results of the data presented in the Bonrath Declaration. The Examiner stated that "[t]he high ratio is in direct proportion to a high conversion to product; whereas as a low

ratio shows a low conversion to product.”^{1/} The Examiner did not indicate upon what basis this supposition was made. For ease of reference, Table 2 from paragraph 16 of the Bonrath Declaration is reproduced here as follows:

The reaction conditions and results are shown in Table 2:

Reaction	KOH:SC	Duration (h)	Pressure (bar)	Conversion to Product (%)	Product Yield (%)	By-Product Yield (%)	Decrease in By-Product Yield (%)
1	1:31	1	16.1	98.0	91.9	3.6	—
	1:250	1	16.1	95.9	92.9	1.4	61
	1:250	2	16.1	97.5	94.3	1.5	58
2	1:27	1	16.3	97.9	94.1	2.5	—
	1:250	1	16.3	96.0	93.7	0.6	76
	1:250	2	16.3	96.9	94.2	0.6	76
3	1:24.5	1	16.8	97.7	94.7	2.0	—
	1:250	1	16.8	95.7	93.3	0.6	70
	1:250	2	16.8	97.2	94.6	0.6	70
4	1:90	1	16.0	99.7	97.6	1.6	—
	1:360	1	16.0	97.1	96.3	0.4	75
5	1:46	1	16.1	97.9	94.4	1.9	—
	1:250	1	16.1	96.5	93.9	0.8	57
	1:250	2	16.1	97.7	95.0	0.9	52

Table 2. Reaction conditions and results (KOH:SC is the ratio of potassium hydroxide to starting carbonyl).

The reactions in which a “high ratio” was used are highlighted here. As can be seen under the column heading “Conversion to Product (%)”, the percentage conversion for the “high ratio” reaction, for each of the five reactions, was somewhat higher than the “low ratio” reactions, although remarkably similar nonetheless. For the first reaction, for example, comparing a 98% conversion for the “high ratio” reaction of 1:31 to a 95.9% conversion for the “low ratio” reaction of 1:250 run at the same temperature and pressure indicates an approximately 2.1% lower percentage

^{1/} From the context, it is believed that by “high ratio”, the Examiner is actually referring to a molar ratio of alkali metal hydroxide to carbonyl compound being greater than 1:200 (1:<200), as contemplated by Tedeschi given that Tedeschi’s Examples all point to such a “high ratio”.

conversion using the "low ratio" reaction. Similarly, the percentage conversion to product for the "low ratio" reaction for the other four ketone reactions are calculated to be approximately 1.9%, 2.0%, 2.6%, and 1.4% lower, respectively, than that of the "high ratio" reactions having the same reaction conditions. These similar percentage conversions to product as between the "high ratio" and "low ratio" reactions indicate that the Examiners' statements regarding the respective conversions to product are not supported in fact. Withdrawal of the rejection is necessitated for this reason also.

Furthermore, the Examiner's assertion that the results "[showing] that [the] high ratio yields a higher by-product percentage than that of a low ratio....merely shows optimization of the process parameters..." misses the mark. (Id. at 4.) Table 2 also lists the percentage of by-product yield (column labeled "By-Product Yield (%)") as well as the calculated percentage decrease in by-product yield (column labeled "Decrease in By-Product Yield (%)"). As shown in Table 2 in the "Decrease in By-Product Yield (%)" column, and as stated in the Bonrath Declaration, paragraph 17, ***"the yield of unwanted diol by-product is between 52% and 76% less using the ..." "low ratio" reactions indicated in Table 2.*** These strikingly favorable percentage decreases in diol by-product yield resulted where percentage conversion to product for the "low ratio" reactions were only marginally less than the percentage conversion to product for the "high ratio" reactions. The Examiner has failed to provide evidence to support the assertion that "this information is not held as patentably distinct information", and the Examiner has concluded as such in contravention of the opinion of the Declarant. (Id. at 4.) For these additional reasons, the rejection cannot stand.

Furthermore, it is submitted that Tedeschi provides no teaching, suggestion or motivation of a process for the manufacture of acetylenically unsaturated alcohol wherein the alkali metal hydroxide is used in an aqueous solution and in the claimed ratio. Tedeschi's only specific disclosures in regard to the state of alkali metal hydroxide used specify a "**powdered** potassium hydroxide". (Example 1 at Col. 4, lines 42-43; Example 2 at Col. 5, lines 6-7; and Example 3, lines 26-27) (emphasis added.)

Moreover, **Tedeschi** discloses that the their "process of making acetylenic alcohols ... **does not require the use of an added solvent medium**." (Col. 1, lines 57-59.) This is prefaced by Tedeschis' statements regarding the art, as follows:

It has been heretofore proposed that acetylenic alcohols be prepared by the so-called Favorsky reaction by interreacting acetylene and a carbonyl compound **in the presence of potassium hydroxide and in the presence of a reaction medium**. Various solvents, such as ethers and polyethers, have been suggested as media in which this reaction may be conducted. By far **the chief disadvantage of such prior processes** has been the need to use at least stoichiometric amounts of potassium hydroxide, i.e., **amounts of potassium hydroxide** which were at least equimolecular, and generally significantly greater than equimolecular with respect to the amount of acetylenic alcohol formed. In other words, the combination of potassium hydroxide and the reaction media heretofore used had only limited activity with respect to effecting reaction between the acetylene and the carbonyl compound. The **use of large amounts of potassium hydroxide** is non-economic, and requires the recovery and processing of potassium hydroxide so that it may be reused.

(Col. 1. lines 27-45) (emphasis added.)

Tedeschi further discloses that "[t]he process of this invention is to be **distinguished from** the processes employing the usual **organic solvents** used in reacting acetylene with a carbonyl compound ...". (Col. 3 lines 30-32.) Tedeschi also discloses, "In this process the liquefied acetylene functions both as a reactant and as a

solvent medium, and the problems which are associated with the use of an added solvent medium, as in the prior art processes, are minimized.” (Col. 2, lines 1-4.)

As noted, Tedeschi discloses the use of a powdered alkali metal hydroxide in the process of making acetylenic alcohols that “does not require the use of an added solvent medium.” (Col. 1, Ins. 58-59). In short, not only does Tedeschi not disclose or suggest an “alkali metal hydroxide salt . . . used in an aqueous solution” as recited in claims 1 and 21 - it discloses a powder – Tedeschi unambiguously teaches away from the use of an “aqueous solution.” But, as is well settled, to do what the prior art counsels against is the antithesis of obviousness. See, e.g., *In re Rosenberger*, 156 USPQ 24, 26, (CCPA 1968) and *In re Buehler*, 185 USPQ 781, 787 (CCPA 1975).

In particular, one skilled in the art would understand Tedeschi as disclosing the use of either ***powdered alkali metal hydroxide in catalytic quantities, particularly the disclosed ratios*** as cited by the Examiner, or alternatively, ***“large amounts of [alkali metal] hydroxide”*** (Col. 1, line 43) ***when used “in the presence of a [solvent] reaction medium.”*** (Col. 1, lines 30-31.) One skilled in the art would understand from the disclosures of Tedeschi that to use alkali metal hydroxide in a solvent reaction medium would require large amounts of the alkali metal hydroxide.

In view of the foregoing, Tedeschi actually teaches away from the use of alkali metal hydroxide in aqueous solution in connection with a molar ratio of the alkali metal hydroxide to the carbonyl compound of less than 1 : 200, as in the present claims. (See, e.g. Col. 1, Ins. 33-39).

We note that various other documents that are of record in the present application also support the patentability of the present claims. For example, document

B2 which is listed in Form PTO-1449, namely FR 2 236 822, published February 7, 1975 (in the French language) and Document C2 which is the Derwent English language Abstract thereof, indicate the ***inadvisability of using an aqueous solution of alkali metal hydroxide***. Document B2 discloses, *inter alia*, that alkali metal hydroxides in the form of aqueous solutions used in previous ethynylations of ketones imparted many disadvantages and are, therefore, deemed unsuitable for use in the reaction. (Page 1, lines 18-22, 28-29 and line 37 – Page 2, line 6.) Documents B2 and C2 disclose that the solution to the problem is the use of “an alkali catalyst in an aliphatic alcohol ...” (Document B2, Page 1, lines 20-21 and 32-34; Examples 1, 3, 8 and 9; and quoting Document C2 (English Abstract), lines 4-5.) Document C2 further discloses that “[u]sing the alkali catalyst in the form of an alcoholic [solution] gives homogeneous reaction [mixtures] simplifying the technology of the process. *The amount of catalyst [required] is reduced*, and the reaction can be carried out in the absence of a gas phase, so that the safety of the process is improved.” (English Abstract lines 6-9) (emphasis added). Thus, Document C2 indicates that the use of alkali metal hydroxide in aqueous solution would be used in the reaction in an even greater amount as compared to alkali metal hydroxide in a solution of aliphatic alcohol.

Accordingly, one skilled in the art would understand the art as a whole as teaching away from use of an aqueous solution of alkali metal hydroxide, and particularly as teaching away from use of an aqueous solution of alkali metal hydroxide in the recited molar ratio of the alkali metal hydroxide to the carbonyl compound of less than 1 : 200. As noted above, to do what the prior art teaches against is the very antithesis of obviousness. See, *e.g.*, *In re Rosenberger*, 156 USPQ 24, 26, (CCPA

1968) and *In re Buehler*, 185 USPQ 781, 787 (CCPA 1975). For this reason also the rejection should be withdrawn.

Furthermore, it is submitted that additional reasoning supports the conclusion that the data provided in the Bonrath Declaration constitutes evidence of surprisingly unexpected results in view of the art. Additional art of record, document B1, namely EP 1 256 560 A2 published November 13, 2002 (in the German language) and its English language equivalent that is of record as Document A2, US App. Publication No. 2002/0183565 ("the '565 publication") disclose the disadvantageous production of diol by-products and offers, as a solution to this problem, a ***deliberate suppression of the conversion rate of the ethynylation reaction***. The '565 publication discloses that "the ethynylation of the ketone, step a), is carried out only to a partial conversion of from 50 to 90%, preferably from 75 to 85%. As a result, a particularly high selectivity of greater than 90%, preferably greater than 97%, is obtained." (Para 43, lines 1-3.) The '565 publication further discloses that "[i]n particular, the formation of diols which occurs as a [by-product of the reaction] and which reduces selectivity and product quality takes place only up to a content of 1%, preferably from 0 to 0.3%." (Para 43, lines 5-9.) The '565 publication further discloses that such lowering of diol by-products "is of particular importance since the diols [otherwise] remain largely intact" in the subsequent step and contaminate the product, and can lead to further undesirable by-products. (Para 43, lines 9-13.) The "advantage of the high selectivity in the partial conversion [is further disclosed as being] retained" in subsequent process steps. (The '565 publication, Paras 43-44.) Premature interruption of the ethynylation conversion is disclosed in the '565 publication as a

means to avoid the problems caused by the diol by-product generation. In view of the '565 publication, it would not have been expected that low by-product percentages could result without suppression of the conversion reaction.

Other art of record also discloses relatively low conversion rates, which vary over significant ranges, for the ethynylation reaction. Tedeschi, which is the basis of the present rejection, discloses conversion percentages of 48.2%, 61% and 87% in Examples 1, 2 and 3, respectively. Document B2 of record which is discussed above, discloses conversion rates in the range of from 60.7% to 95%. (FR 2 236 822, Examples 1-3, 8 and 9.) Document C1, an article by Tedeschi et al., discloses conversion percentages using ammonia solvent based on acetone in the range of from 52% to 95% in Table I, and in the range of from 31% to 75% in Table II.

The Bonrath Declaration presents data reporting the percent Conversion to Product for ethynylation reactions using aqueous potassium hydroxide and molar ratios in accordance with the present claims. The data is shown in Table 2, paragraph 16, of the Bonrath Declaration, which is also reproduced above. Conversion to Product percentages listed for the claimed invention range are high and within a small range, *i.e.*, from 95.7% to 97.7%. Yet the By-Product Yield is disclosed to be in a range of from 0.4 to 1.5%. Thus, as observed Dr. Bonrath, the favorably low by-product yield given the relatively high conversion to product percentage range is unexpected in view of the art that indicates that low by-product percentages are achievable upon suppressing conversion to product. (See, *e.g.* Declaration, paras 17-18).

For each of the above reasons independently, it is submitted that the rejection has been rendered moot. Furthermore, the body of evidence and

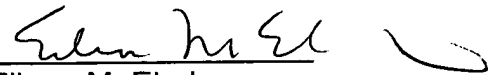
argumentation as a whole presented on the record to date overwhelmingly demonstrates that the rejection must fall. Withdrawal of the rejection is requested.

Accordingly, for the reasons set forth above, withdrawal of the rejection and allowance of the claims are respectfully requested. If the Examiner has any questions regarding this paper, please contact the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop Amendment, Commissioner For Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on April 23, 2008.


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